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TO ALL WHOM IT MAY CONCERN:

Be it known that WE, Mickey Coke and Paula Yob Gwyn, citizens of the United States, whose post office addresses are 5505 Corporate Drive, Troy Michigan and 5505 Corporate Drive, Troy Michigan, respectively, have made an invention in

A METHOD AND APPARATUS FOR INTERACTIVE ONLINE MODELLING AND EVALUATION OF A PRODUCT

of which the following is a

SPECIFICATION

BACKGROUND OF THE INVENTION

[0001]   This invention relates to product modelling and evaluation, and more particularly, it relates to systems and methods for allowing users to modify product features directly on the internet in real time and share such designs with other internet users, wherein the modifications along with other user-specific attributes may be collected, recorded and evaluated by the internet server.

Description of the Related Art

[0002]   In recent years, there have been advances in the field of product design. A product's design increases its appeal to customers and enhances the customer's desire to own a product which is designed and tailored based on their needs or preferences. Since different customers typically have different preferences or needs, it is important both to include the customers in the

design process, and to quickly learn the needs and preferences of different customer groups. For this reason, there have been attempts at increasing the functionality of modelling software and systems in order to provide various modelling options for the customers.

[0003]   For example, automotive web sites offer different vehicle models from manufacturers' product lines with various features that typically can be ordered or previewed when a vehicle is purchased. Hence, the customer can choose the color, tires and the upholstery in the vehicle from a range of available options. The customer can also add other features to the basic model, such as CD/stereo equipment, air-conditioning, wider rims etc.

[0004]   Sporting goods companies also have different product lines offered on their internet websites, wherein the customer can choose the item and choose different features offered for that item. For example, if the item is a golf shirt, the customer can choose between various shirts offered by a specific manufacturer, and then choose the size and the color.

[0005]   Furthermore, home improvement companies offer web sites where customers can choose different products with different features from the company's product lines when remodelling or re-designing their homes. Based on a customer's inputs, various design options are offered, and the customer can choose between them. Once the desired design is chosen, a list of products necessary for completing the chosen design is provided to the customer.

[0006]   Various design software programs have also been provided. For example, architectural and interior design software used by architectural and interior design companies offer the customer the choice of different home styles for a new home, or different components for re-designing different rooms in the house. The customers can provide comments, which allows the

architects or designers to design the houses or rooms in such a way so as to increase their appeal to customers and satisfy the customers' needs and preferences.

[0007] As the above examples indicate, those involved with product design have recognized the importance of involving the customers in the design process. Indeed, some in this field have gone so far as to allow customers to "tailor" certain product features. For example, a shoe retailer may allow the customer to "tailor" certain shoe features, such as primary color, secondary color, lining color, cage color, mid-sole color, out-sole color and even a logo, to the customer's needs and preferences. The "tailoring" consists of choosing from a set of pre-determined options for each feature of a particular shoe design. The customer has a pre-determined number of options relating to primary color, secondary color etc. Hence, the customer has a limited opportunity to tailor the shoe by way of selecting a preferred option for each feature.

[0008] However, all prior art online modelling software is believed to suffer from a common drawback in that it fails substantially to allow the customers to modify the product features on a fully interactive basis, especially with respect to various feature attributes such as shape, three-dimensional location and appearance. Thus, the aforementioned online modelling software fails to involve the customer in the actual product design process and does not allow the customers to provide an immediate feedback with respect to their preferences and needs. Furthermore, the on-line modelling referred to above does not allow for collecting customer data and relating such data to the customers' design inputs in order to be evaluated by the internet server. Accordingly, there remains a need for an online modelling tool which permits the user to modify product features, especially feature attributes relating to shape, three-dimensional (3D) location, and

appearance, and which allows such modifications to be recorded and related to recorded user

data, thereby allowing for an evaluation of different customer groups' needs and preferences.

The prior art is not believed to meet these needs.

SUMMARY OF THE INVENTION

[0009]   It is an object of the present invention, therefore, to enable the customers to actively

participate in the product design process by providing real-time design inputs.

[0010]   Another object of the invention is to allow the product developers to evaluate such

design inputs and use the design preference data for purposes of product improvement or

targeted marketing.

[0011]   In order to meet these and other objects that will become apparent with reference to

further disclosure set forth below, the present invention provides a method and system for

interactive online modelling and evaluation of a product, for instance, through a website hosted

on a server on behalf of a product vendor and made available to a prospective product customer

at his remote user computer. The present invention works by transmitting an interface from the

web server to the user computer which contains links to various product features that may be

modified. Through the user computer, the customer may choose a set of product features that

may be used as default features in the product design. Alternatively, the default features may be

provided by the server. Subsequently, the customer may, by using the user computer, choose to

modify one or more product features from the default set. The request to modify a particular

product feature is transmitted to the web server, from which one or more software components

relating to this product feature are transmitted to the user computer. The customer is then

allowed to select and modify one or more attributes of the chosen feature and view a simulation of the product incorporating the feature modifications on the downloaded interface.

[0012] In one embodiment of the present invention, the customer is allowed to modify one or more attributes of the chosen feature, where at least one attribute is relating to the feature's shape, 3D location or appearance.

[0013] In another embodiment of the present invention, all of the feature modifications are transmitted to the web server and recorded.

[0014] In yet another embodiment of the present invention, pre-determined user data are collected from the customer.

[0015] In still another embodiment of the present invention, the collected customer data are related to the user's demographics.

[0016] In yet another embodiment of the present invention, the collected user data are recorded on the server.

[0017] In still another embodiment of the present invention, the recorded user data and the corresponding recorded feature modifications are combined and evaluated.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The accompanying drawings, which are incorporated and constitute part of this disclosure, illustrate preferred embodiments of the invention and serve to explain the principles of the invention.

Fig. 1 is a block diagram of a system for online modelling and evaluation in accordance with the invention.

Fig. 2 is an illustrative diagram presenting the methodology for online modelling and evaluation in accordance with the invention.

Fig. 3 is an illustrative diagram presenting an exemplary interface downloaded from a server with a set of features and modification links.

Fig. 4 is an exemplary user interface with a simulation window for car modelling and evaluation.

DETAILED DESCRIPTION OF EXEMPLARY
EMBODIMENTS OF THE INVENTION

[0019]   With reference to Fig. 1, an exemplary embodiment of the present invention will now be described. A system 100 for interactive online modelling and evaluation of a product is illustrated. The system 100 includes a website hosted on a server 110 on behalf of a product designer, vendor or manufacturer, which website is made available to a prospective product customer at his remote user computer 130. It also includes a data communications link 120 for communication between the web server 110 and the user computer 130. The system 100 works by transmitting an interface (not shown) from the web server 110 via data communications link 120 to the user computer 130. The transmitted interface contains links to various product features which may be modified by the user. Through the user computer 130, the customer may choose a set of product features which may be used as default features in the product design. Alternatively, the default features may be provided automatically by the server 110. Subsequently, the customer may, by using the user computer 130, choose to modify one or more product features from the default set. The request to modify a particular product feature is

transmitted via the data communications link 120 to the web server 110, from which one or more software components 140 relating to various attributes of the chosen product features are transmitted to the user computer 130. The software components 140 are stored on a computer memory 160, from where they are retrieved when the user chooses to modify one or more attributes. The user is also allowed to view a simulation of the product incorporating the feature modifications on the downloaded interface.

[0020] In a preferred embodiment, all feature modifications are transmitted to the web server 110 via data communications link 120 and recorded on a database 150. The feature modifications are then available to the product vendors, designers or manufacturers for evaluation in order to determine the users' needs and preferences.

[0021] The user may be allowed to modify one or more attributes of the chosen feature, where at least one attribute is relating to the feature's shape, three-dimensional (3D) location or appearance. As the customer modifies the attributes, such modifications are recorded on the server database 150 via data communications link 120 and offered to the product designer, vendor or manufacturer for evaluation.

[0022] In a preferred embodiment, the interface, which is transmitted to the user computer 130 from the web server 110, is capable of collecting pre-determined user data. As the user enters the information pertaining to user's demographics and other information of interest to the product vendor, designer or manufacturer, the information is transmitted back to the server 110 via the data communications link 120 and stored on the server database 150. The obtained user information is then associated with the feature modifications made by this particular user, which

allows the product vendors, designers and manufacturers to discern the needs and preferences of

a particular demographic group in order to design, manufacture and provide different customer

groups with the products that best fit their needs and preferences.

[0023]   Fig. 2 depicts an illustrative diagram presenting the methodology for online modelling

and evaluation in accordance with the invention. When the user requests from a server 110

(Fig. 1) an interface 210 for communication with the server 110, the interface 210 is downloaded

from the server 110 to the user computer 130 via the data communications link 120. The

interface 210 is capable of showing a plurality of pre-determined features available for

modification. The user can then request one or more of such features from the server 110.

Subsequently, the user computer 130 receives from the server 110 one or more software

components 140 relating to the features selected for modification. The software components 140

include various attributes associated with the features selected for modification, which attributes

may be modified.

[0024]   The interface 210 is capable of permitting the user to modify the design of the product

in various ways. For example, the user may be allowed to add features 220, delete features 230

or even modify features 240. The features may be modified by modifying one or more attributes

associated with the feature. For example, the feature may be scaled 242, rotated 244 or even

skewed 246. Furthermore, the feature's three-dimensional (3D) location in the product may be

changed 248, or even its appearance, including color pattern, may be altered 249.

[0025]   The interface 210 is further capable of enabling the user to view the product with all the

feature modifications that have been made. In that respect, the user can view a simulation of the

product incorporating the scaled, rotated or skewed features via a visual simulation interface segment 270. The user can also view a simulation of the product with the added features, or without the deleted features, on the visual simulation interface segment 270. In case the user is not satisfied with the modifications that were made, the user can further modify the chosen features or even choose a different set of features to be modified. In case the user is not satisfied with a default model having a pre-determined set of features, which may be initially displayed, the user is also enabled to change a product model 260, namely, a default product that is initially simulated with a pre-determined set of features, one or more of which may be modified at the user's request. Once the user is satisfied with the product design, the modifications pertaining to such design are transmitted to the server 110 where the data from different users are collected 252 and stored on the server memory 150.

[0026] The gathered and stored data depict consumer preference. As said before, pre-determined user data also may be collected and associated with the gathered data representing the feature modifications. From this set of associated data, consumer preference of a particular consumer group may be discerned and the product design may be altered in response to such discerned consumer preference. In some instances, gathered data may be available in real-time to product designers for review and evaluation. Alternatively, gathered data may be statistically organized based on a pre-determined set of parameters to discern consumer preference. For example, product designers may statistically organize age data and the corresponding gathered data representing feature modifications to determine preferred designs for different age groups. The product designers may also statistically organize gender data, user

income data and corresponding gathered data representing feature modifications to discern particular preferences of, for example, middle-income women.

[0027] Gathered data may also be scientifically integrated in the product design process. For example, gathered data may be used to alter product design based on discerned consumer preference. Furthermore, gathered data may be used for end-stream customer-specific modifications of the product design. It also may be used for mid-stream modifications of an in-progress product design. Naturally, the gathered data may be used to provide a basis for professional product design by providing an initial model representing the discerned customer preferences.

[0028] In addition, gathered data may be used by product vendors in a marketing process. For example, the data may be used by the vendors to develop a marketing strategy targeted to specific customer groups. Since the preferences of different customer groups may be discerned from the gathered data, a targeted marketing may be developed.

[0029] Gathered data may also be used by product manufacturers in a manufacturing process. The customer preferences are discerned from gathered data, the design of the manufactured product may be modified based on such preferences, and the manufacturers may consequently modify the production lines to incorporate the modifications representing the consumer preferences. These modifications in the manufacturing process may be made at any time.

[0030] In Fig. 3, an exemplary interface 320 downloaded from the server 310 with a set of features and modification links is illustrated. As said before, when the user requests from the server 310 an interface for communication with the server 310, the interface 320 is downloaded

from the server 310 to the user computer. In this exemplary embodiment, the interface 320 has a

visual simulation interface segment 370, which initially may display a default car model and

subsequently present the user's design, and a set of feature links 380 which the user can use

during the car design session.

[0031]   The user may choose to add certain features by clicking on an "add feature" button 322.

Once the user clicks on the "add feature" button 322, the user is directed to the set of feature

links 380, where one or more features to be added can be chosen. For example, the user can

choose to add different accessories 381, grills 382, wheels/tires 383 or a decklid 384. Once the

features to be added are chosen, the software components 140 (see Fig. 1) relating to the chosen

features are downloaded from the server 310. The software components include various

attributes relating to each particular feature. For example, if the user chooses a feature "wheel"

385, various software components representing wheel attributes such as rim size, shape, three-

dimensional (3D) location of the wheel, etc., are downloaded from the server, and the user may

choose the wheel having the desired attributes to be added in the design. Similarly, if the user

chooses the feature "accessories" 381, various software components representing different

accessories, such as bike rack, spoiler, fog lamps, and ground effects, and their attributes (size,

color, shape, location etc) are downloaded from the server to the user computer. The user is then

allowed to choose the particular accessory having the desired attributes to be added to the design.

[0032]   The user also may choose to delete certain features by clicking on a "delete feature"

button 330. Once the user clicks on the "delete feature" button 330, the user is directed to the set

of feature links 380, where one or more features to be deleted can be chosen. For example, the

user can choose to delete lamps 386, flares 387, or even quarter panels 388. Once the features to

be deleted are chosen, they are erased from the simulation viewed at the visual simulation interface segment 370. It should be noted that the user may be able to click on a particular feature to be deleted directly on the visual simulation interface segment 370 and then click on the "delete feature" button 330 to effect the feature deletion.

[0033]   The user may also choose to modify one or more car features by modifying their attributes. Once the user chooses the particular features to be modified, the user can click on a modify feature button 340, where various modification tools are offered. For example, the user may be allowed to click on a "scale" button 342, which would allow the user to modify the size of the chosen feature. The user also may be allowed to skew the feature by clicking on the "skew" button 346. The user further may be allowed to rotate the feature by clicking on the "rotate" button 344. The user additionally may be allowed to change the default 3D location of the chosen feature by clicking on a "position" button 348.

[0034]   The user can view a final simulation of the car incorporating all added and modified features via the visual simulation interface segment 370. The visual simulation interface segment 370 is capable of allowing a 360-degree view of the simulated car. It should be noted that while the user is adding, deleting, and modifying different chosen features, all those changes are recorded on the server 310. While the visual simulation interface segment 370 allows for a 360-degree view of the product, it may be important for the users to view the simulation from different sides of the product at the same time, in order to better determine whether the feature modifications are satisfactory. An interface incorporating a plurality of visual simulation interface segments is shown in Figure 4.

[0035]   Fig. 4 illustrates a car-design user interface incorporating a plurality of visual

simulation interface segments presenting different views of the car. The interface 420 has a set

of feature links 480 and a plurality of visual simulation interface segments 470. In this

exemplary interface 420, the visual simulation interface segments 470 represent the top, front,

side and three-dimensional views of the car. The interface 420 also includes a set of feature

modification buttons 440, such as chassis, cab, and wheel modification buttons. As the user

chooses particular features and modifies their attributes, the car simulations incorporating such

modifications are simultaneously displayed on each of the visual simulation interface segments

470, thus allowing the user to view the car modifications from different angles. The different

angle views enable the user to determine whether the chosen modifications satisfy the user's

preferences and needs.

[0036]   It is to be appreciated that these techniques and network configurations can also be

applied in industries other than the auto industry. For example, sports equipment designers can

use these techniques to collect and evaluate data relating to various sports equipment. Moreover,

these techniques and network configurations may be used in any industry where the product

design is a part of the product's development and/or manufacturing processes.

[0037]   The foregoing merely illustrates the principles of the invention by reference to

exemplary embodiments thereof. Various modifications and alterations to the described

embodiments will be apparent to those skilled in the art in view of the teachings herein. It will

thus be appreciated that those skilled in the art will be able to devise numerous techniques which,

although not explicitly shown or described herein, embody the principles of the invention and are

thus within the spirit and scope of the invention.